APPENDIX D

INFORMATION MODELING

A. INTRODUCTION

1. Data and activity models must be developed to support planning and management activities for data, information, and activities required to achieve the mission and business goals and objectives of the Department of Defense. Data and activity models provide the link needed to unify functional planning, modeling, and implementation activities into a coherent organization or functional activity. These models are also used to develop and maintain DoD standard data elements.

2. Redundancies and inconsistencies in data and activities are difficult to identify when each organizational sub-component, information system, database, report, form, or user requirement is managed in isolation. Once data and activities can be viewed from an organization-wide perspective and placed in logical groupings, redundancies and inconsistencies can be identified, and data and process sharing can be achieved.

3. Data and activity modeling taken together are referred to as information modeling. Information modeling by approved methods will contribute to achieving Goal 3 of the DoD Data Administration Program, "Use of Common Procedures and Tools, " which in turn will contribute to achieving Goal 4, "Quality Data. " (See Section F. of Chapter 1, above.)

B. TYPES OF MODELS

1. The models needed to support any size, or complexity, of organization can be separated into two basic types:

a. Activity models.

(1) An activity model provides a framework for identifying, defining, and organizing the functional strategies, rules, and activities needed to manage and support the way an organization does, or wants to do, business. It provides a graphical and textual framework for organizing activities into manageable groupings to facilitate their shared use and control throughout the organization.

(2) While data models represent the data necessary to achieve the mission of the organization, activity models document the functional activities of an organization. Activity models also document the associations or relationships among primary items of information that are important to the organization. Activity modeling permits the development, consolidation, and use of the same functional

activities across multiple Functional Areas. As with data modeling, this approach can help control the duplication and repetition of functional activities. A functional activity can be modeled once and then made available to all potential users rather than each user separately designing, developing, and maintaining the same activity. Activity models also facilitate the reuse of automated applications.

(3) Rule modeling, which occurs within both the data and activity modeling, includes identifying, capturing, analyzing, refining, and documenting the business strategies, rules, and activities. Once identified and captured, business rules can be analyzed and refined. This may result in decomposition of a complex rule to multiple rules, discarding or refinement of a current business rule, or identification of a new business rule.

b. Data Models.

(1) A data model is a graphical and textual representation of analysis that identifies the data needed by an organization to achieve its mission, functions, goals, objectives, and strategies; and to manage and operate the organization. It describes the scope, boundaries, and types of data needed to support the functional activities at all levels of the organization.

(2) The data model identifies what data are shareable across functional and organizational boundaries, and what data are redundant and unnecessary. It provides the top-down, organization-wide perspective needed for planning, designing, building, and maintaining future integrated information systems with a single point-of-entry for the data and contains information about the business rules of the organization.

(3) Data modeling techniques and tools help management and other personnel to accurately plan, identify, represent, relate, standardize, and store the data needed by the organization.

C. PURPOSE OF THE MODELS

1. The primary purpose of activity and data modeling is formal, structured analysis of how a function operates (or should operate), and what data and information is needed to accomplish the function's mission. Lower level models must reflect the model at the next higher level. Modeling supports effective and efficient implementation of a function's goals and objectives, its management strategies, and its functional practices. Modeling also helps managers to identify and evaluate improvements in goals and objectives, strategies, and practices. The disciplined analysis and documentation performed during modeling facilitates definition of information system functional requirements. In turn, this simplifies and accelerates system development, and helps to ensure that the deployed system meets user needs.

2. Activity and data models address the activities required to plan, design, model, synchronize, standardize, and control data used by functional activities at all levels. They can be used to develop more accurate software, information systems, and databases. Information systems that are developed using activity and data modeling techniques and tools are easier and more cost-effective to update and maintain as the functional requirements change.

D. ACTIVITY MODELING STAGES

The activity modeling methodology and tools selected will define the exact procedures to be used, but the following are the generally accepted stages of activity modeling:

1. Establishing the activity model scope (e.g., strategic, mid-level, operational) and obtain commitment of the senior organization official of the activities that are to be modeled.

2. Identifying and assembling an activity modeling team that has the functional activities, knowledge, and expertise. Personnel within the Functional Area with data modeling expertise should be part of the team.

3. Identifying and obtaining relevant documentation, such as standard operating procedures, technical manuals, and other documents that define and discuss the laws, policies, rules, practices, procedures, and activities that are employed to operate the function.

4. Conducting activity modeling training workshops.

5. Conducting activity modeling sessions to develop activity models.

6. Refining the activity models to directly support functional policies, rules and activities, and ensuring consistency with the data model being developed at the same time as well as consistency with higher level activity models.

7. Fully documenting the activity models.

8. Acquiring senior management's approval of the activity models.

E. DATA MODELING STAGES

The data modeling methodology and tools selected will define the exact procedures to be used, but the following are the generally accepted stages of data modeling:

1. Identifying and assembling a data modeling team. This must include members from the activity modeling team to ensure consistency and verification of

understanding of the activity model by the data modeling team.

2. Identifying and obtaining available relevant documentation, such as the organization's mission, functions, roles and responsibilities statements; strategic business management plan, if available; and other documents on the organization's business directions and plans.

3. Conducting data modeling training workshops.

4. Conducting data modeling sessions to develop data models using the activity models and higher level data models as a primary information resource.

5. Refining the data models to directly support mission, goals, objectives and functional strategies.

6. Fully documenting the data models.

7. Analyzing the data model to prepare priority and decision scenarios for implementation and for the next lower level modeling activity; e.g., strategic level analysis to identify functional partitions, building an enterprise data architecture, and developing a decision package to obtain priorities for order and timing of additional modeling based on the architecture.

8. Acquiring senior and other levels of management approval of the data models and obtaining direction and timing for modeling projects.